

A NEWLY DETERMINED SPECIES OF ELAPHOMYCES FROM OREGON

JAMES M. TRAPPE

Forestry Sciences Laboratory, Pacific Northwest Forest and Range
Experiment Station, Forest Service, U. S. Department of
Agriculture, Corvallis, Oregon 97331

GASTÓN GUZMÁN

Instituto Politecnico Nacional, Escuela Nacional de Ciencias Biologicas,
Departamento de Botanica, Laboratorio de Micología, Mexico 17, D. F.

In type studies of *Scleroderma* species (Guzmán, 1967), the junior author determined *S. subviscidum* (Zeller, 1947) to be a species of *Elaphomyces*. Subsequent study of the type collection by the senior author confirmed this conclusion and established that the species is distinct from others in the genus *Elaphomyces*.

Freehand sections mounted in 5% KOH were used in the anatomical studies needed for redescribing the species. Sections mounted in Melzer's solution showed no distinctive reactions. The term "peridium" in the description denotes the entire structure surrounding the gleba in conformance to normal mycological usage; past workers with *Elaphomyces* have often used "peridium" to denote only the innermost layer of that structure.

Elaphomyces subviscidus (Zeller) Trappe and Guzmán, comb. nov. (fig. 1). *Scleroderma subviscidum* Zeller, Mycologia 39:296. 1947.

Ascocarp subglobose, 3×5 cm; surface smooth, white to grayish, drying yellowish, nonreactive with KOH, encrusted with soil held by inconspicuous but abundant pale hyphae emerging from the surface; peridium 1–2 mm thick when dry, reviving to a thickness of $2\frac{1}{2}$ –3 mm, with a thin, yellowish outer layer and a thick, pallid inner layer; gleba dark brown, powdery. Peridium: Emergent superficial hyphae sinuous, hyaline, thin-walled, $2\frac{1}{2}$ – 4μ broad. Outer $\pm 150\mu$ of peridium yellowish in cross section, densely interwoven of single to fascicled hyphae 3– 5μ broad, with walls mostly hyaline and thin but in places thickened to 0.5μ and often yellowish, the entire stratum obscured by hyaline to yellowish, amorphous debris. Inner layer $\pm 2,500\mu$ thick, abruptly differentiated from the outer layer as \pm circumferentially aligned but interwoven fascicles of a few to nearly 100 hyaline, highly refractive hyphae 4– 8μ broad with the walls mucilaginous-thickened to nearly filling the cells; yellowish, amorphous debris scattered throughout. Gleba hyphae dispersed among spores, thin-walled, hyaline to pale yellowish-brown, mostly $1\frac{1}{2}$ – 3μ broad but a few 5– 6μ ; dark brown, amorphous deposits scattered throughout between hyphae. Spores globose, 12– 21μ broad exclud-

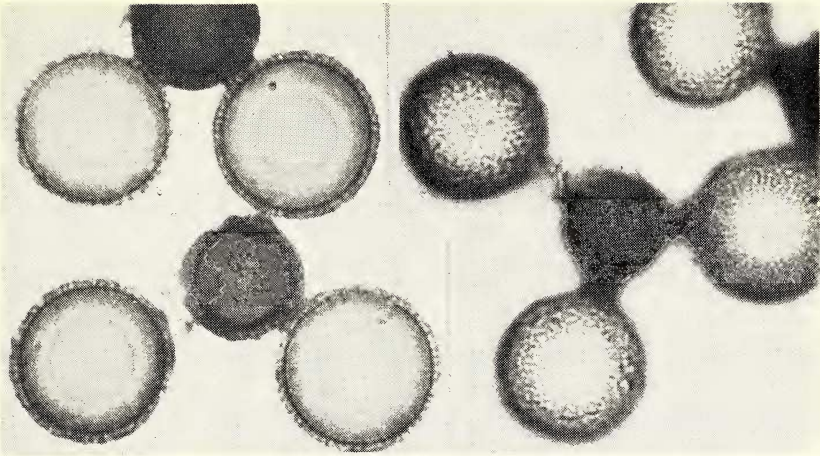


FIG. 1. Spores of *Elaphomyces subviscidus* (holotype) $\times 1,000$: left, in optical cross section; right, focused on spore surfaces.

ing ornamentation, $14-23$ (-24) μ with ornamentation, the smaller spores very dark brown, the larger tending to be lighter brown, all containing a large, spherical oil droplet; larger spores thin-walled, smaller ones with walls up to 0.5μ thick; ornamentation of crowded spines $1-2 \mu$ long and $\pm 0.2 \mu$ thick, separated by $0.2-0.5 \mu$ or sometimes joined in two's and three's by ridges but never formed into a partial reticulum, embedded in an inconspicuous, mucilaginous matrix. No asci detected, but spores frequently clinging together in globose clusters of 8.

Holotype. Epigeous on decayed granite soil, Oregon, Jackson Co., Prospect, R. A. Pendleton, June 28, 1925 (Zeller 6842, NY). Known only from the type collection.

Although neither asci nor basidia were seen, the species is clearly an *Elaphomyces* by virtue of its large, closely echinulate spores often clustered in groups of 8 and the anatomical organization of peridium and gleba. The epigeous habit and "somewhat viscid" peridium noted by Zeller are atypical for *Elaphomyces* and need to be confirmed by additional collections. *Elaphomyces* are commonly dug out by rodents, which occasionally leave them lying on the surface of the ground. No suggestion of viscosity can be seen in KOH mounts; if the specimen was wet when collected, the adherent soil and hyphae might have given the ascocarp a slippery feel.

Elaphomyces subviscidum differs from the other smooth surfaced, noncarbonaceous species of the genus in its pale peridial coloration, brown spore mass, and relatively large spores. The outer peridial layer (the "cortex" of past terminology for the genus) completely lacks the *Cenococcum* type of structural organization that characterizes many species of *Elaphomyces* (Trappe, 1971).

LITERATURE CITED

- GUZMÁN, G. 1967. Taxonomía del género *Scleroderma* Pers. emend. Fr. *Ciencia* (Mexico) 25:195-208.
- TRAPPE, J. M. 1971. The mycorrhiza-forming Ascomycetes. In E. Hacskeylo, ed., *Proc. 1st No. Amer. Conf. on Mycorrhizae*, Urbana, Ill. U. S. Government Printing Office, pp. 19-37.
- ZELLER, S. M. 1947. More notes on Gasteromycetes. *Mycologia* 39:282-312.

REVIEWS

Plant Speciation. By VERNE GRANT. X + 435 pp. Columbia University Press, New York, 1971. \$15.00.

Plant Speciation was written to complement the author's earlier work, *The Origin of Adaptations*. In that work he dealt only with the processes and patterns of evolution found in diploid sexual organisms. The present book is intended to be a detailed treatment of those evolutionary phenomena that are unique to plant populations.

Although such an undertaking could have resulted in an important contribution, *Plant Speciation*, in fact, offers little that is new to the student of plant evolution. The book is divided into five sections: Nature of Plant Species, Divergence of Species, Refusion and Its Consequences, Derived Genetic Systems and Evolution of Hybrid Complexs. Much of the classical and current literature in these areas is discussed. In particular, the author's own research over the last twenty odd years is integrated into this body of information.

The fundamental framework of this book represents an approach to plant evolution that has passed its zenith. To be sure, the author is not the only biologist who views the species as a basic biological unit (indeed, he most likely holds the majority opinion). However, alternative considerations to the "species problem" have had a wide acceptance. There are, for instance, a great many biologists (both botanists and zoologists) who emphasize in their own work the population as the basic unit of evolution and regard species only as taxonomic units. This view is not only supported by the fundamental concepts of population genetics but also by the current data on gene flow. These data indicate that the role of gene flow in limiting the differentiation of populations (evolution) is at best minor. In other words, there appears to be no good evidence that gene flow is responsible for integrating populations into natural units called species. There is every reason to believe that it is similar selection pressures operating at different places, and not gene flow, that limits the divergence of populations of sexual organisms just as it is in the case of geographically disjunct groups of apomictic organisms.

In Grant's book, there is no mention of the contributions that the theory and practice of numerical taxonomy and taximetrics have made toward clarifying the "nature of species." Also, noticeably missing is any significant discussion of the role studies of protein analysis (amino acid sequences) and isozyme variation in natural populations have played and will play in our understanding of the processes of plant evolution.

Plant Speciation will be of limited use to the beginning graduate student. However, it falls far short of being the successful synthesis *Variation and Evolution in Plants*, by G. L. Stebbins, was two decades ago.—DENNIS R. PARNELL, Department of Biological Science, California State College, Hayward 94542.